



# HIGH TORQUE SERIES DL4

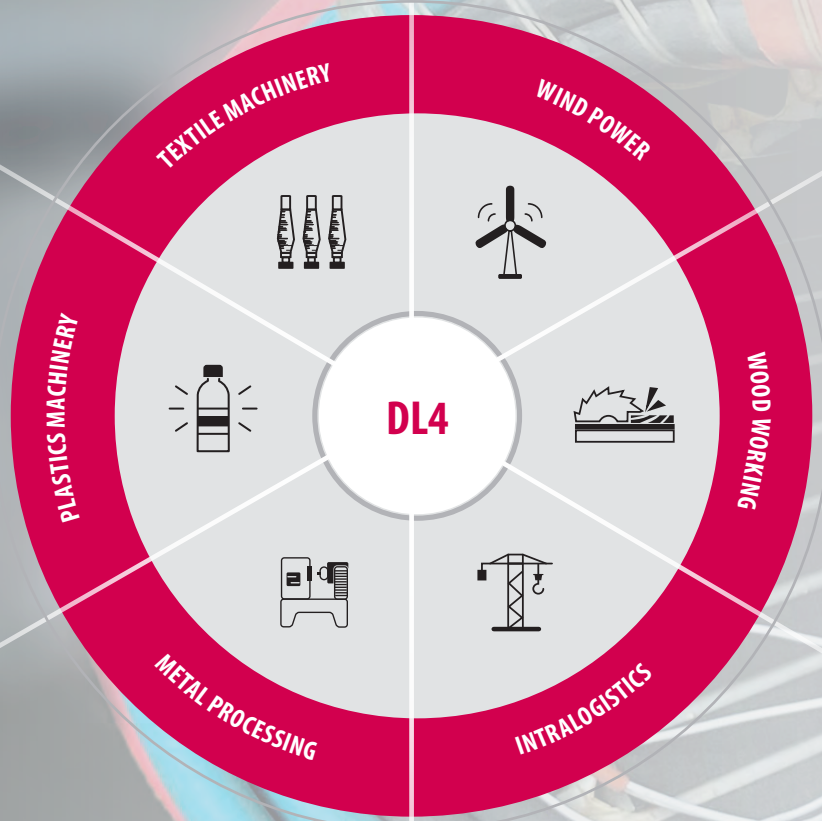
SERVO SYSTEMS - WITH AIR AND LIQUID COOLING

EN

# APPLICATION

- Spinning technology
- Weaving
- Knitting
- Finishing

- Pitch systems
- Yaw systems
- Auxiliary equipment



- Extrusion
- Injection molding
- Blow forming
- Foils
- Handling

- Saws
- Milling
- Drilling
- Portals
- Shredder

- Bending
- Cutting
- Grinding
- Lathes
- Milling
- Die casting
- Pressing
- Drilling

- Stacker cranes
- Tower cranes
- Lifts and escalators
- Transportation

DL4 motors stand for the highest dynamics and maximum flexibility in the connection of the machine design. The use of rare earth permanent magnets ensures a high energy density – the design of the magnetic circuit for sinusoidal voltages combines low ripple torque with high overload without danger of demagnetization.



CE  
c  US  
FS

### **WATER COOLED VERSION DL4-LC**

The new water-cooled variant uses optimal thermal conditions and thus combines the properties of the highest power density, the best overload with high reserves. This results into about 25% higher torque compared to the forced ventilated versions.



### **SERVO SYSTEMS**

In combination with the servo inverter series KEB COMBIVERT F6, as well as assembled encoder / motor cables, powerful Drive systems are created, that perfectly match optimal properties of speed and torque characteristics, as well as provide high efficiency and easy startup.

More details of the DRIVE CONTROLLER portfolio are described in the catalogue COMBIVERT F6.



## FEATURES

### MOTOR STANDARDS

Design	IM B5 according to CEI EN 60034-7 (1993)
Protection	IP 54 according to CEI EN 60034-5-(2001)
Shaft	with keyway balancing with half key CEI 2-23 (1993) special shaft (on request)
Encoder systems	Resolver Hiperface SRS50 - 16 bit Hiperface SRM50 - 16 bit /Multiturn - 12 bit without encoder (SCL-operation)
Thermal design	ISO Kl. F / dT <sub>max</sub> =105K, according to CEI -EN 60034-1 (2000)
Winding	ISO Kl. H – according to CEI 2-3 (2000)
Nominal voltage	400 V
No. of poles	8
Thermal protection	PT 1000
Cooling	CS = self cooled version – IC 410 motor without servo-ventilation CF = forced ventilation – IC 416 servo-ventilated motor, according to CEI EN 60034-6-(1997) 1 ph. 230V AC - connection on clipboard in the terminal box LC = liquid cooled
Bearings	lubricated for life
Operating position	any
Colour	black RAL 9005

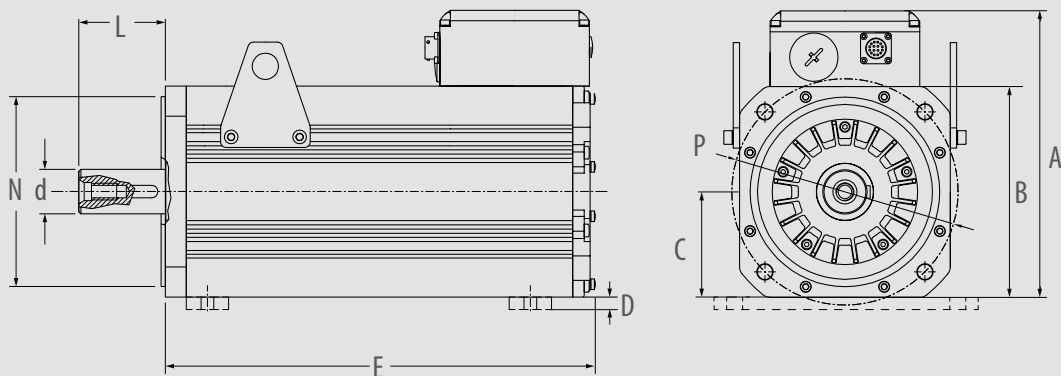
### MOTOR OPTIONS

Foot/ Flange mounted version IM B3 / IM B35
IP 65 – without ventilation (with shaft seal ring D-side)
without keyway Grade of balancing: G 2.5 in accordance with ISO 1940-1 (1993)
Safety Resolver Hiperface SRS50 - 16 bit - safety Hiperface SRM50 - 16 bit /Multiturn - 12 bit- safety
Holding brake 24V DC Permanent magnet (SE, SF) Spring applied (SG)
Additional inertia

### ACCESSORIES

Encoder cables
Resolver 00S6L50 - 10xx (xx = 1 ... 50 m)
Hiperface 00S6L55 - 10xx (xx = 1 ... 50 m)
Connection: Speedtec plug M23
Motor cable 2.5mm <sup>2</sup>
00S4619 - 00xx (xx = 1 ... 50 m)
Connection: Speedtec plug M23 (for SE/ ... /CS)
Terminal box (from SE/.../CF)

Motor cable 4mm<sup>2</sup> (on request)



TECHNICAL DATA DL 4

AIR COOLED VERSION

SIZE	LENGTH	COOLING	MOTOR										BRAKE			DIMENSIONS																							
			T <sub>do</sub> [Nm]	T <sub>N</sub> [Nm]	P <sub>N</sub> [kW]	T <sub>max</sub> [Nm]	I <sub>do</sub> [A]	I <sub>N</sub> [A]	I <sub>max</sub> [A]	n <sub>N</sub> [min <sup>-1</sup> ]	J <sub>L</sub> [kgcm <sup>2</sup> ]	J <sub>Z</sub> [kgcm <sup>2</sup> ]	m [kg]	T <sub>NBr</sub> [Nm]	J <sub>br</sub> [kgcm <sup>2</sup> ]	m <sub>Br</sub> [kg]	A [mm]	B [mm]	C [mm]	D [mm]	E <sub>without brake</sub> [mm]	E <sub>with brake</sub> [mm]	∅ d [mm]	L [mm]	∅ N [mm]	∅ P [mm]													
SE	L2	CS	12	10.2/10/9.8	1.6/2.1/3.1	23.8/23.5/23.3	3.7/4.9/7.2	3.4/4.4/6.2	8.6/11/16	1500/2000/3000	8.52	14**	32	5.9	2.7(CS) 3.2(CF)	194	142/158*	80	9	245	295	24 <sub>js</sub>	50	130 <sub>js</sub>	165														
		CF	15.4	14.6/14/12.6	2.3/2.9/4	28.5/28.2/28	5/6.5/9.4	4.9/6.1/8	10.3/13.2/19.2							224				340	390																		
	L4	CS	22	20.5/20/w16.5	3.2/4.2/5.2	44.3/45.9/45.9	6.6/9/13.4	6.4/8.5/10.3	14.9/21.1/30.9							15.1				16.6	194					224	300	350											
		CF	31	29/28/24	4.6/5.9/7.5	53.2/55/55	9.3/12.7/18.6	9/11.9/15	17.9/25.3/37.1							21.3				24.3	194					224	355	405											
	L6	CS	30	27.5/25.6/20	4.3/5.4/6.3	68.2/69.6/68.8	9.2/12.4/18.2	8.8/11/12.5	23.6/32.4/46.4							21.7				26	194					224	450	500											
		CF	42	39/37.5/33	6.1/7.9/10.4	81.9/83.5/82.6	12.9/17.4/25.3	12.5/16.1/20.6	28.3/38.8/55.7							28.27				29.5	194					224	410	460											
	L8	CS	39	33.5/30.4/22.2	5.3/6.4/7	91.7	12/15.9/23.5	10.8/12.9/13.9	32/42.2/61.8							28.27				29.5	194					224	505	555											
		CF	54	49/47/39	7.7/9.8/12.3	100.1	16.8/22.1/32.5	15.8/20/24.3	38.4/50.6/74.2							28.27				29.5	194					224	505	555											
SF	L2	CS	33	31.5/30.5/29.5	3.3/6.4/9.3	82.3/82/82.2	6.7/14.8/20.2	6.7/14.3/18.8	18.4/40.4/55.1	1000/2000/3000	49	50**	130	60	11(CS) 13(CF)	272	200/224*	112	12/20*	259	379	42 <sub>ks</sub>	82	180 <sub>js</sub>	215														
		CF	45	42.7/42/43	4.5/8.8/13.5	93.5/93.1/93.4	9.3/20.5/27.9	9.1/19.7/27.4	21.9/48.1/65.6							296				353	473																		
	L4	CS	60	56/51/44	5.9/10.7/13.8	154.3/154/154.6	13.6/25.6/40.9	13.1/22.4/30.9	37.9/71/114							89				43	272					296	333	453											
		CF	89	87/85/80	9.1/17.8/25.1	203.4/203.6/204.5	20.2/37.9/60.7	20.4/37.3/56.1	52.4/98.3/157							128				49	296					272	428	548											
	L6	CS	82	72/62/53	7.5/13/16.7	223.6/223.1/223.3	17/37.3/46.6	15.3/29/31	49.9/110/137							128				54	272					296	408	528											
		CF	130	124/118/111	13/24.7/34.9	280.1/280/280.4	26.9/59.1/73.9	26.4/55.2/64.9	65.6/144/180							167				64	296					272	502	622											
	L8	CS	102	90/76.3/65	9.4/16/20.4	271.5/270.7/271.1	21.7/43.5/58	19.7/33.5/38	62.4/125/166							167				68	272					296	483	703											
		CF	163	154/144/137	16.1/30.2/43	373.5/373.5/373.8	34.7/69.5/92.7	33.8/63.2/80.1	90.2/180/241							167				78	296					272	577	697											
	SG	L2	CS <sup>(*)</sup>	100(153)	93/76/60	9.7/15.9/18.8	147.4	21.6/40.5/54	21.6/33.1/34.8							38.3/71.9/95.8				1000/2000/2800	224						350	149	39(CS) 43(CF)	361	264/292*	132/146*	18/14*	340	475	48 <sub>ks</sub>	110	250 <sub>js</sub>	300
			CF	145	143/125/117	15/26.2/34.3	267.1	31.3/58.7/78.3	33.2/54.4/67.9							69.5/130.3/173.7														389				470	605				
L4		CS <sup>(*)</sup>	182(270)	150/113/45	15.7/23.7/14.1	258.8	36.8/73.7/98.2	32.7/49.2/26.1	63.1/126.2/168.3	401	109	361	389	447	582																								
		CF	310	290/260/230	30.4/54.5/67.4	543.9/558.6/526.3	62.8/127.3/161.9	63.1/110.2/133.5	132.6/265.2/342.2	577	126	389	361	577	712																								
L6		CS <sup>(*)</sup>	270(400)	205/115/0	21.5/24.1/0	386/386/378.4	58.3/97.2/143	47.6/44.5/0	100.4/167.3/251	577	143	361	389	554	689																								
		CF	440	395/350/300	41.4/73.3/88	736.8/736.8/657.9	95/158.3/237.5	91.7/135.5/174.2	191.6/319.4/427.8	753	164	389	361	684	819																								
L8		CS <sup>(*)</sup>	340(493)	270/130/0	28.3/27.2/0	464.9/464.9/455.8	68.8/137.7/183.5	58.8/56.6/0	113.4/226.7/302.3	753	177	361	389	661	796																								
		CF	580	530/470/320	55.5/98.4/93.8	964.9/833.3/771.9	117.4/239.3/313.1	115.4/204.7/185.8	235.3/406.4/501.9	753	203	389	361	791	926																								

(\*) Data for S3-operation 40%- 1min. CS = self cooled CF = forced ventilation

\*\* Option: Additional Inertia

\* Motor version CF

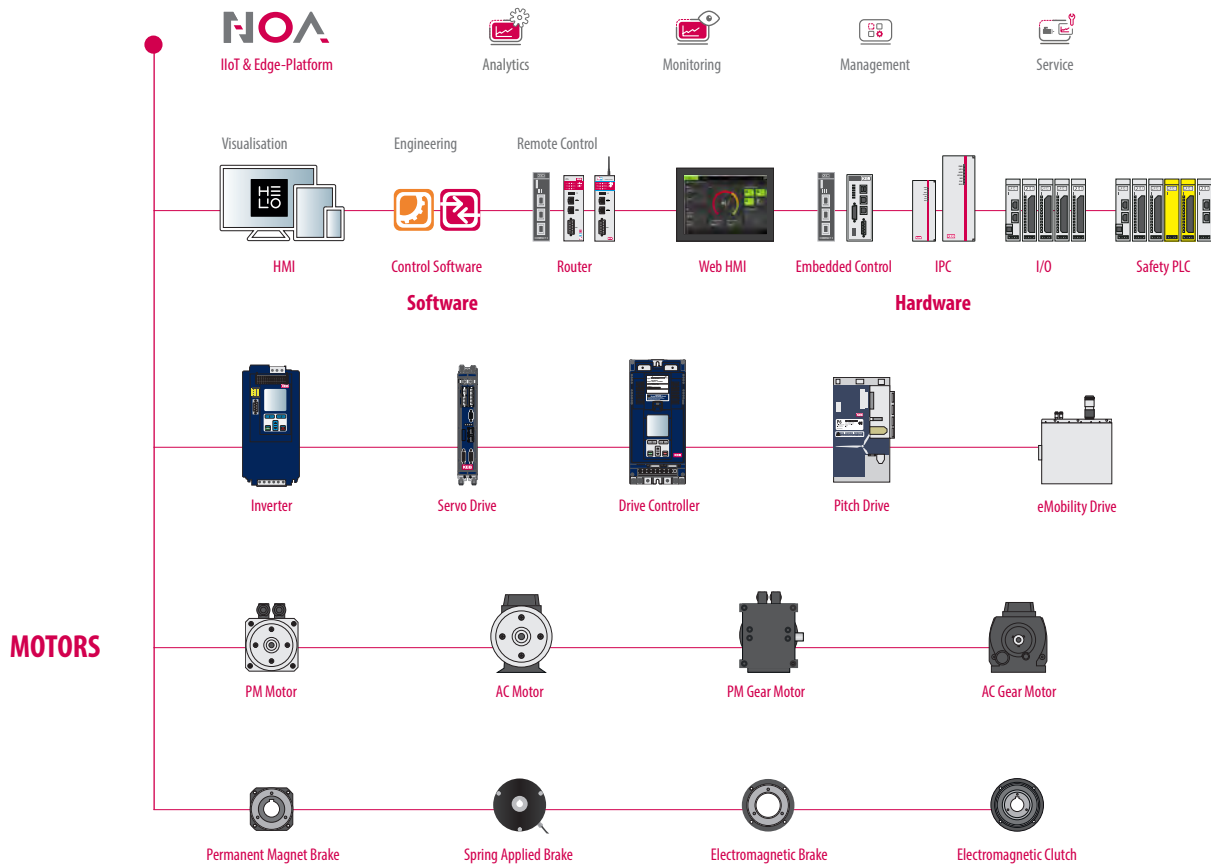
SW: special shaft

LIQUID COOLED VERSION

SIZE	LENGTH	COOLING	MOTOR										BRAKE			DIMENSIONS																																								
			T <sub>do</sub> [Nm]	T <sub>N</sub> [Nm]	P <sub>N</sub> [KW]	T <sub>max</sub> [Nm]	I <sub>do</sub> [A]	I <sub>N</sub> [A]	I <sub>max</sub> [A]	n <sub>N</sub> [min <sup>-1</sup> ]	J <sub>L</sub> [kgcm <sup>2</sup> ]	Q [L/min]	m [kg]	T <sub>NBr</sub> [Nm]	J <sub>br</sub> [kgcm <sup>2</sup> ]	m <sub>Br</sub> [kg]	A [mm]	B [mm]	C [mm]	D [mm]	E <sub>without brake</sub> [mm]	E <sub>with brake</sub> [mm]	∅ d [mm]	L [mm]	∅ N [mm]	∅ P [mm]																														
SG	L2	LC	185	167	17.4	290	47	48	85	1000	6	83	350	149	39(CS) 43(CF)	365	270	132	18	413	548	48 <sub>ks</sub>	110	250 <sub>js</sub>	300																															
				157	29.6		82	79	149																	401	8	115	577	205	40(CS) 44(CF)	606	741																							
				145	39.5		132	116	227																									753	10	147	700	205	40(CS) 44(CF)	661	796															
	350			36.7	97		90	168	1000																																	10	147	700	205	40(CS) 44(CF)	606	741								
	330			62.2	170		149	288																																									1800	12	180	753	205	40(CS) 44(CF)	606	741
	310			84.4	227		187	355																																																
	L4		385	510	53.4	810	126	118	196	1000	577	10	147	700	205	40(CS) 44(CF)	365	270	132	18	606	741	55 <sub>ks</sub>	110	250 <sub>js</sub>	300																														
				480	90.5		209	185	327																		1800	12	180	753	205	40(CS) 44(CF)	606	741																						
				445	121.2		314	257	505																										2600	12	180	753	205	40(CS) 44(CF)	606	741														
	L6		555	770	720	1100	188	181	287	1000	753	12	180	700	205	40(CS) 44(CF)	365	270	132	18	709	844	55 <sub>ks</sub>	110	250 <sub>js</sub>	300																														
				685	129.1		314	301	501																		1800	12	180	753	205	40(CS) 44(CF)	709	844																						

### SYSTEM SOLUTIONS - EVERYTHING FROM A SINGLE SOURCE

The DL4 servo motors extend the extensive product portfolio of KEB Automation. Your advantage: From HMIs and controls to frequency converters and motors to brakes, you will find ideally coordinated components at KEB. Realize your individual requirements with an attractive price-performance ratio, central contacts and optimized drive performance.



### PART NUMBER SERVO MOTORS

#### 11 DIGIT CODE DL4

F	4	D 4	2	2	B	2	3	0 0
Size	Lengths	Type	Speed Voltage	Cooling Protection	Shaft Brake	Connection	Encoder	Option

#### Configuration Code

Specific versions and samples of motors are described with a configuration.

Part number is 00SM000-CMAT -followed by an EXECUTION-CODE for DL4. f.e: **SE - L2 CS SP15 FKN BRN ENC01 OP00**

X X	X X	X	X	X	X	X	X X
Size/Lengths	Type	Speed/ Voltage	Cooling	Brake	Connection	Encoder	Options

**KEB**

MANUFACTURED BY



**Brusatori**  
MOTORI ELETTRICI

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